

IN THE CLAIMS:

1. (Currently amended) A method for treating a patient to improve cardiac performance and efficiency of the patient's heart, the method ~~imbalance of the neuro-endocrinological system;~~ comprising:

providing at least one electrode into electrical communication with a region of nervous tissue in a patient's body;

automatically applying electrical stimulation via the at least one electrode to improve balance of ~~[[the]]~~ a neuro-endocrinological system of the patient; and

delivering ~~one of a overdrive cardiac pacing therapy to the patient's heart of a type that improves cardiac output, and a post-extra-systolic potentiation therapy for at least one cardiac cycle.~~

2. (Previously presented) The method of claim 1, wherein providing at least one electrode further comprises providing at least one implanted electrode adapted to be located adjacent to a patient's spine.

3. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode located external to the patient's body.

4. (Previously presented) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode adapted to be located in a subcutaneous space of the patient's body.

5. (Previously presented) The method of claim 1, wherein applying electrical stimulation further comprises:

monitoring one or more predetermined physiologic parameters of the patient; and

adjusting the electrical stimulation based on the one or more of the monitored predetermined physiologic parameters.

6. (Original) The method of claim 5, further comprising administering cardiac resynchronization therapy; and wherein adjusting the electrical stimulation further comprises adjusting the electrical stimulation based on the administered cardiac resynchronization therapy.

7. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing a nerve associated with a trunk portion of the body of the patient.

8. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing at least one thoracic vertebrae.

9. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing at least one thoracic vertebrae in the range of T1-T12.

10. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing thoracic vertebrae T1-T12.

11. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing at least one thoracic nerve bundle.

12. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing at least one thoracic nerve bundle in the range of T1-T12.

13. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode in a region containing thoracic nerve bundles T1-T12.

14. (Original) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode located adjacent to an intrinsic cardiac ganglia.

15. (Previously presented) The method of claim 1, wherein providing at least one electrode further comprises providing at least one electrode adapted to be located within a cardiac or vascular structure for intracardiac or intravascular neurostimulation.

16. (Original) The method of claim 1, wherein the at least one electrode is selected from the group consisting of implanted electrodes, cutaneous electrodes, and subcutaneous electrodes.

17. (Currently amended) An apparatus for treating a patient to improve cardiac performance and efficiency of the patient's heart, the apparatus ~~imbalance of the neuro-endocrinological system~~, comprising:

at least one electrode adapted to be located in a region associated with nervous tissue in a patient;

means for automatically applying electrical stimulation via the at least one electrode to improve balance of ~~[[the]]~~ a neuro-endocrinological system of the patient in response to a physiologic signal of the patient; and

means for delivering ~~one of a overdrive cardiac pacing therapy and a post-extra systolic potentiation therapy~~ to the patient's heart of a type that improves cardiac output.

18. (Previously presented) The apparatus of claim 17, wherein the at least one electrode further comprises at least one implanted electrode adapted to be located adjacent a patient's spine.

19. (Previously presented) The apparatus of claim 17, wherein the at least one electrode is adapted to be located external to the patient's body.

20. (Previously presented) The apparatus of claim 17, wherein the at least one electrode is adapted to be located in a subcutaneous space of the patient's body.

21. (Original) The apparatus of claim 17, wherein means for applying electrical stimulation further comprises:

means for monitoring one or more predetermined physiologic parameters of the patient; and

means for adjusting the electrical stimulation based on the one or more predetermined physiologic parameters.

22. (Original) The apparatus of claim 21, further comprising means for administering cardiac resynchronization therapy; and wherein the means for adjusting the electrical stimulation further comprises means for adjusting the electrical stimulation based on the administered cardiac resynchronization therapy.

23. (Previously presented) The apparatus of claim 17, wherein the at least one electrode is adapted to be located in a region containing a nerve associated with a trunk portion of the body of the patient.

24. (Previously presented) The apparatus of claim 17, wherein the at least one electrode is adapted to be located in a region containing at least one thoracic vertebrae.

25. (Previously presented) The apparatus of claim 17, wherein the at least one electrode is adapted to be located in a region containing at least one thoracic vertebrae in the range of T1-T12.

26. (Previously presented) The apparatus of claim 17, wherein the at least one electrode is adapted to be located in a region containing at least one thoracic nerve bundle.

27. (Previously presented) The apparatus of claim 17, wherein the at least one electrode is adapted to be located in a region containing at least one thoracic nerve bundle in the range of T1-T12.

28. (Currently amended) A method for treating a patient to improve cardiac performance and efficiency of the patient's heart, the method ~~imbalance of the neuro-endocrinological system~~, comprising:

- providing at least one electrode in a region associated with nervous tissue in a patient's body;

- automatically applying electrical stimulation via the at least one electrode to improve balance of the neuro-endocrinological system of the patient based at least in part on the monitoring one or more predetermined physiologic parameters of the patient;

- adjusting the electrical stimulation based on the one or more predetermined physiologic parameters; and

- delivering one of an overdrive cardiac pacing therapy and a post-extra systolic potentiation therapy ~~during at least one cardiac cycle~~ to the patient's heart to improve cardiac output.

29. (Currently amended) A method for improving cardiac performance and efficiency of a heart of a patient, the method ~~imbalance of the neuro-endocrinological system~~, comprising:

providing at least one electrode in a region associated with nervous tissue in a patient's body;

automatically applying electrical stimulation via the at least one electrode to balance a neuro-endocrinological system of the patient based at least in part upon [[a]] monitoring one or more predetermined physiologic parameters of the patient;

adjusting the electrical stimulation based on the one or more predetermined physiologic parameters; and

delivering one of an overdrive cardiac pacing therapy and a post-extra systolic potentiation therapy ~~for at least one cardiac cycle~~ to the heart to improve cardiac output.

30. (Currently amended) An apparatus for treating a patient to improve cardiac performance and efficiency of the patient's heart, the apparatus ~~imbalance of the neuro-endocrinological system~~, comprising:

at least one electrode adapted to be located in a region associated with nervous tissue in a patient's body;

means for automatically applying electrical stimulation via the at least one electrode to improve ~~imbalance~~ balance of [[an]] a neuro-endocrinological system of the patient;

at least one sensor associated with the patient and adapted to monitor one or more predetermined physiologic parameters of the patient;

means for both automatically applying and automatically adjusting the electrical stimulation based on the one or more predetermined physiologic parameters; and

means for delivering one of an overdrive cardiac pacing therapy and a post-extra systolic potentiation therapy for at least one cardiac cycle to the heart to improve cardiac output.

31. (Currently amended) An apparatus for improving cardiac performance and efficiency of a heart of a patient, the apparatus ~~imbalance of the endocrinological system,~~ comprising:

at least one electrode adapted to be located in a region associated with nervous tissue in a patient's body;

means for automatically applying electrical stimulation via the at least one electrode to alter the functioning of the patient's heart;

at least one sensor associated with the patient and adapted to monitor one or more predetermined physiologic parameters of the patient;

means for both automatically applying and automatically adjusting the electrical stimulation based on the one or more predetermined physiologic parameters; and

delivering one of an overdrive cardiac pacing therapy and a post-extra systolic potentiation therapy for at least one cardiac cycle to the heart to improve cardiac output.

32. (Currently amended) An apparatus for improving cardiac performance and efficiency of a heart of a patient, the apparatus ~~imbalance of the neuro-endocrinological system,~~ comprising:

at least one electrode adapted to be located in a region associated with nervous tissue in a patient's body;

at least one sensor associated with the patient and adapted to monitor one or more predetermined physiologic parameters of the patient;

a controller adapted to automatically apply electrical stimulation via the at least one electrode to ~~alter the a~~ neuro-endocrinological system of the patient, and the controller being further adapted to automatically adjust the electrical

stimulation based on the one or more predetermined physiologic parameters;
and

means for delivering one of an overdrive cardiac pacing therapy and a
post-extra systolic potentiation therapy to the heart to improve cardiac output.

33. (Currently amended) An apparatus for treating a patient to improve cardiac performance and efficiency of the patient's heart, the apparatus imbalance of the endocrinological system, comprising:

at least one electrode adapted to be located in a region associated with nervous tissue in a patient;

a controller adapted to automatically apply electrical stimulation via the at least one electrode based upon a physiologic signal of the patient to improve the cardiac efficiency of the patient's heart; and

means for delivering one of an overdrive cardiac pacing therapy and a
post-extra systolic potentiation therapy to the heart to improve cardiac output.

34. (Original) The apparatus of claim 33, wherein the at least one electrode is adapted for positioning in a region containing thoracic nerve bundles T1-T12.

35. (Original) The apparatus of claim 33, wherein the at least one electrode is adapted for positioning adjacent to an intrinsic cardiac ganglia.

36. (Original) The apparatus of claim 33, wherein the at least one electrode is adapted for positioning within a cardiac or vascular structure for intracardiac or intravascular neurostimulation.

37. (Original) The apparatus of claim 33, wherein the controller includes a driver circuit to deliver electrical stimulation to a cardiovascular system in the patient's body.

38. (Original) The apparatus of claim 37, wherein the driver circuit includes a circuit to deliver pacing pulses.

39. (Original) The apparatus of claim 37, wherein the driver circuit includes a circuit to deliver high-voltage stimulation.

40. (Original) The apparatus of claim 33, wherein the controller includes a drug-delivery device to provide a biologically-active agent to the patient.